

PART IV  
DECISIONS OF ADVISORY BOARD MEETING

# Decisions

## of the Advisory Board Meeting

conducted on August 14, 2000

**1. The meeting of Advisory Board was conducted to provide an opportunity of a personal encounter and communication among the Advisory Board Members.** The importance of the regular e-mail communication was noted. Members agreed to continue the effort of maintaining the Multidisciplinary Community for Intelligent Systems measurements and analysis.

**2. The Board continued the discussion of the issue what should be labeled "intelligent system"** and how to productively define "intelligence," since measuring something not clearly defined might not be relevant. There was a consensus that Intelligent Systems can be distinguished by their ability to

- a) generalize
- b) build representation
- c) make choices
- d) formulate goals

These abilities are demonstrated by intelligent systems in different degree and they, probably, should be used for establishing the Vector of Intelligence.

**3. The ability to make choices should be regarded as a central property of intelligence.** Other properties of interest are linked with intelligence, too. Yet, other properties might and probably should be considered separately from the ability of making choices, e.g. the ability to process, represent, and communicate knowledge, as well as the ability to formulate the goals and determine their own behavior.

**4. The consensus was that the effort should continue to be directed towards modeling the intelligence** focusing specifically upon systems that a) make choices (suitable, or appropriate ones), b) form their own goals. Formation of goals is linked closely with mechanisms of intentionality. Part of the discussion was focused upon the place of learning in the mechanisms of intelligence: whether it should be considered a separate "ability" or it is built-in within all other abilities, e.g. as in the list in p.2 of this document.

The opinion of the Board was that (at least initially) we should be interested in Systems for Making Appropriate Choices.

**5. The Board decided to coordinate the activities of the research community interested in Intelligent Systems around the Systems Capable of Making Appropriate Choices.** and their critical experimental and analytical characteristics that allow for evaluation of their performance in a particular environment. Within these systems a subdomain should be recognized of systems that form their own goals. Probably, other subdomains can be delineated, too. It would be important to discover and formulate these subdomains as well as to demonstrate the relationships among them.

**6. A part of the discussion was concentrated upon linkage between the concept of "success" and the concept of "choice."** The concept of "success" is the actual measure of performance of the intelligent system. This measure is ingrained within the present definition of intelligence (by J. Albus). The phenomenon of "choice" seems to be the tool that serves the "ability to act appropriately." The importance of the issue of "choice" was underlined by the members of Board and the decision was made to analyze the situations where the success is not the matter of *chance* but rather the matter of *choice*.

**7. A rough scale of the degrees of intelligence was agreed upon:**

Degree III – Self-deciding systems

Degree II – Self-targeting systems, that implicitly incorporate their goal in their decision

Degree I – Self-deciding and self-targeting systems that are educable (W. Freeman's suggestion).

Educable systems are those that autonomously formulate the goals for their learning subsystem.

**8. The Board has agreed upon the short term focus of research in the area of intelligent systems and measuring their performance and intelligence.** As a result of our short term research activities, the research community should learn how to predict the IS performance if the system will be considered within a different environment (new but related to the previous one). The last focus of research was proposed by C. Weisbin, and the meeting decided to concentrate around this focus at least during the upcoming year ("Weisbin's Challenge").

**9. The Board outlined how the work on Weisbin's Challenge should be initiated.** Meeting decided to formulate 10-12 research problems collectively related to measuring the performance and the active characteristics of the intelligent system (their "intelligence") for the cases of systems that make appropriate choices, form their own goals, or both.

For each of these systems the preferability should be compared of two technical solutions:

- a) one of them based upon a single, general purpose machine
- b) another based upon utilization of multiple limited capabilities systems

The (a) and (b) would allow to understand what is preferable: to focus upon universal (broad) or specialized (narrow) types of intelligence in developing IS.

**10. The Board agreed that there is an urgent need of developing a draft of the Vocabulary in the Area of Intelligent Systems.** The draft of the Vocabulary should be distributed among the members of Advisory Board for collecting comments and issuing a corrected and improved version.

Among the terminological issues that demand for urgently resolving them are the following terms:

- state space
- variables
- goal
- gestalt
- autonomy
- complexity
- intentionality
- representation
- learning
- behavior.

The goal of this iterative work on the Vocabulary is to achieve a consensus within the community on how to discuss the issues in the area of Intelligent Systems.

The Board decided to distribute these decisions via e-mail and to dedicate the next meeting to the topics bounded to the solution of these problems.